Citation:

Driscoll TR, Harrison JE, Steenkamp M. Alcohol and drowning in Australia. *Injury Control and Safety Promotion* 2004;11(3):175-181.

PubMed ID: 15764104

Study Design:

Retrospective Cohort Study

Class:

B - Click here for explanation of classification scheme.

Research Design and Implementation Rating:

 NEUTRAL: See Research Design and Implementation Criteria Checklist below.

Research Purpose:

To examine the contribution of alcohol to drowning deaths in Australia.

Inclusion Criteria:

- Drowning deaths that occurred in Australia from 1 July 2000 to 30 June 2001 were identified using the National Coroners Information System (NCIS).
- The current analysis was based on those deaths for which the Coronial process was completed by March 2003 ('closed cases').

Exclusion Criteria:

- Deaths in Queensland were excluded since the data was recently entered into the system and was not accessible to researchers at the time of the current study

Description of Study Protocol:

Recruitment

- Drowning deaths that occurred in Australia (excluding Queensland) from 1 July 2000 to 30 June 2001 were identified using the National Coroners Information System (NCIS).
- The current analysis was based on those deaths for which the Coronial process was completed by March 2003 ('closed cases').

Design: Retrospective cohort study

Blinding used (if applicable): not applicable

Intervention (if applicable): not applicable

Statistical Analysis

- Files were imported into SAS and analyzed, primarily using frequency tables, cross tabulations and text searching

Data Collection Summary:

Timing of Measurements

Comparison was made with the Australian Bureau of Statistics (ABS) national deaths data and with currently used values of attributable fractions for alcohol and drowning in Australia (based on USA data on drownings from 1980 to 1984).

Dependent Variables

- Drowning deaths

Independent Variables

- Valid blood alcohol measurements
- For 20 deaths there was significant body decomposition, which may result in misleading blood alcohol levels

Control Variables

None mentioned

Description of Actual Data Sample:

Initial N: 6,259 total deaths not classified as natural cause deaths. 289 drowning deaths were identified, 5% less than comparable ABS data

Attrition (final N): 240 were 'closed cases' and valid blood alcohol measurements were available for 137 (58%) of these.

Age: not reported

Ethnicity: not reported

Other relevant demographics:

Anthropometrics

Location: Australia

Summary of Results:

Key Findings

- Level of blood alcohol ranged from 0 in 47% of cases to 0.10 g/100 ml or greater in 12% of all cases

- Alcohol appeared to contribute to approximately 19% of these fatal drowning incidents (25% for recreational aquatic activity, 16% for incidental falls into water, 12% for drowning due to suicide), with blood alcohol levels for these cases ranging from 0.020 g/100 ml to 0.375 g/100 ml
- Using >0.10 g/100 ml as the cut-off, the estimated all-ages proportions of unintentional drowning attributed to alcohol was 17% in the current study, compared to the 34% currently used for Australia based on data from North America

Involvement of Alcohol by Incident Type for Drowning Deaths in Australia, July 2000 - June 2001

Incident Type	All Cases - Case Count	All Cases - % Alcohol	Valid Cases - Case Count	Valid Cases - % Alcohol
Recreational	107	18	57	25
Incidental	58	10	45	16
Deliberate Self-Injury	38	8	17	12
Occupational	7	0	3	0
Other and Unknown	30	20	15	20
Total	240	16	137	19

Author Conclusion:

A high level of alcohol appears to be present less frequently among recent drowning deaths in Australia than has been assumed to be the case to date. Nevertheless, many drowning victims have high levels of blood alcohol, and public health efforts to minimize the use of alcohol in association with activity on or near water should be continued. Despite some deficiencies, the NCIS appears to be a very useful source of information on public health issues, and to provide a better basis for assessing and monitoring alcohol-related drowning deaths in Australia than the published attributable fractions used to date.

Reviewer Comments:

Valid blood alcohol measurements were available for 137 (58%) of deaths. Only 1 year of retrospective case review.

Research Design and Implementation Criteria Checklist: Primary Research

Relevance Questions

1.	Would implementing the studied intervention or procedure (if found successful) result in improved outcomes for the patients/clients/population group? (Not Applicable for some epidemiological studies)	N/A

2.	Did the authors study an outcome (dependent variable) or topic that the patients/clients/population group would care about?	Yes
3.	Is the focus of the intervention or procedure (independent variable) or topic of study a common issue of concern to nutrition or dietetics practice?	Yes
4.	Is the intervention or procedure feasible? (NA for some epidemiological studies)	Yes

Validity Questions

1.	**Was the research question clearly stated?**	Yes
1.1.	Was (were) the specific intervention(s) or procedure(s) [independent variable(s)] identified?	Yes
1.2.	Was (were) the outcome(s) [dependent variable(s)] clearly indicated?	Yes
1.3.	Were the target population and setting specified?	Yes
2.	**Was the selection of study subjects/patients free from bias?**	Yes
2.1.	Were inclusion/exclusion criteria specified (e.g., risk, point in disease progression, diagnostic or prognosis criteria), and with sufficient detail and without omitting criteria critical to the study?	Yes
2.2.	Were criteria applied equally to all study groups?	N/A
2.3.	Were health, demographics, and other characteristics of subjects described?	No
2.4.	Were the subjects/patients a representative sample of the relevant population?	???
3.	**Were study groups comparable?**	Yes
3.1.	Was the method of assigning subjects/patients to groups described and unbiased? (Method of randomization identified if RCT)	Yes
3.2.	Were distribution of disease status, prognostic factors, and other factors (e.g., demographics) similar across study groups at baseline?	Yes
3.3.	Were concurrent controls used? (Concurrent preferred over historical controls.)	N/A
3.4.	If cohort study or cross-sectional study, were groups comparable on important confounding factors and/or were preexisting differences accounted for by using appropriate adjustments in statistical analysis?	No

3.5.	If case control or cross-sectional study, were potential confounding factors comparable for cases and controls? (If case series or trial with subjects serving as own control, this criterion is not applicable. Criterion may not be applicable in some cross-sectional studies.)	No
3.6.	If diagnostic test, was there an independent blind comparison with an appropriate reference standard (e.g., "gold standard")?	N/A
4.	**Was method of handling withdrawals described?**	Yes
4.1.	Were follow-up methods described and the same for all groups?	Yes
4.2.	Was the number, characteristics of withdrawals (i.e., dropouts, lost to follow up, attrition rate) and/or response rate (cross-sectional studies) described for each group? (Follow up goal for a strong study is 80%.)	Yes
4.3.	Were all enrolled subjects/patients (in the original sample) accounted for?	No
4.4.	Were reasons for withdrawals similar across groups?	N/A
4.5.	If diagnostic test, was decision to perform reference test not dependent on results of test under study?	N/A
5.	**Was blinding used to prevent introduction of bias?**	Yes
5.1.	In intervention study, were subjects, clinicians/practitioners, and investigators blinded to treatment group, as appropriate?	N/A
5.2.	Were data collectors blinded for outcomes assessment? (If outcome is measured using an objective test, such as a lab value, this criterion is assumed to be met.)	Yes
5.3.	In cohort study or cross-sectional study, were measurements of outcomes and risk factors blinded?	Yes
5.4.	In case control study, was case definition explicit and case ascertainment not influenced by exposure status?	N/A
5.5.	In diagnostic study, were test results blinded to patient history and other test results?	N/A
6.	**Were intervention/therapeutic regimens/exposure factor or procedure and any comparison(s) described in detail? Were interveningfactors described?**	???
6.1.	In RCT or other intervention trial, were protocols described for all regimens studied?	N/A
6.2.	In observational study, were interventions, study settings, and clinicians/provider described?	Yes
6.3.	Was the intensity and duration of the intervention or exposure factor sufficient to produce a meaningful effect?	Yes
6.4.	Was the amount of exposure and, if relevant, subject/patient compliance measured?	N/A

6.5.	Were co-interventions (e.g., ancillary treatments, other therapies) described?	N/A
6.6.	Were extra or unplanned treatments described?	N/A
6.7.	Was the information for 6.4, 6.5, and 6.6 assessed the same way for all groups?	Yes
6.8.	In diagnostic study, were details of test administration and replication sufficient?	N/A
7.	**Were outcomes clearly defined and the measurements valid and reliable?**	???
7.1.	Were primary and secondary endpoints described and relevant to the question?	Yes
7.2.	Were nutrition measures appropriate to question and outcomes of concern?	Yes
7.3.	Was the period of follow-up long enough for important outcome(s) to occur?	Yes
7.4.	Were the observations and measurements based on standard, valid, and reliable data collection instruments/tests/procedures?	???
7.5.	Was the measurement of effect at an appropriate level of precision?	Yes
7.6.	Were other factors accounted for (measured) that could affect outcomes?	???
7.7.	Were the measurements conducted consistently across groups?	Yes
8.	**Was the statistical analysis appropriate for the study design and type of outcome indicators?**	Yes
8.1.	Were statistical analyses adequately described and the results reported appropriately?	Yes
8.2.	Were correct statistical tests used and assumptions of test not violated?	Yes
8.3.	Were statistics reported with levels of significance and/or confidence intervals?	N/A
8.4.	Was "intent to treat" analysis of outcomes done (and as appropriate, was there an analysis of outcomes for those maximally exposed or a dose-response analysis)?	N/A
8.5.	Were adequate adjustments made for effects of confounding factors that might have affected the outcomes (e.g., multivariate analyses)?	No
8.6.	Was clinical significance as well as statistical significance reported?	Yes
8.7.	If negative findings, was a power calculation reported to address type 2 error?	No
9.	**Are conclusions supported by results with biases and limitations taken into consideration?**	Yes
9.1.	Is there a discussion of findings?	Yes

	9.2.	Are biases and study limitations identified and discussed?	Yes
10.	**Is bias due to study's funding or sponsorship unlikely?**		Yes
	10.1.	Were sources of funding and investigators' affiliations described?	Yes
	10.2.	Was the study free from apparent conflict of interest?	Yes